A DISPLAY UNIT

The present invention relates generally to an assembly for mounting a display item. More particularly, the present invention relates to an assembly for mounting a picture or photograph.

Most frames are made of flange elements assembled with fixings to enclose the screen and displayed material. Known "clip frames" replace the flanges with clips .A recent patent, US Patent No 6282828 makes the entire frame into a bowed clip mechanism, mainly for table top use. This involves the planar element (display screen) being an integral structural element.

Other designs include flexible hooped frame elements, inflexible hoops with slots for the corners of flexible display items, curved panels with elastic or rubberised ties, and a seemingly traditional frame with a spring loaded corner junction.

As with the above systems the proposed invention at least in preferred embodiments is intended to be inexpensive, being suitable for flat packing ,self-assembly, and capable of being made from inexpensive materials. It can be used to display photos prints certificates etc., as well as clocks, mirrors, "windows", screens, lamps, or electronic displays. The present invention potentially has a one piece cut-out frame unit or even no frame at all.

Three dimensional multiple versions can be obviously adapted to form lamps, screens, boxes and many other entities.

It is intended that the displayed item be smaller than the display screen leaving a transparent margin exposing the structural mechanism, and so allowing flexibility of size.

Viewed from a first aspect the present invention provides an assembly for mounting a display item, the assembly comprising a sheet element and at least one

elongate member, the at least one elongate member being attached to the edge of the sheet element at first and second points; wherein, in use, the at least one elongate member retains the display item in position.

As the display item is retained in position by elongate members, at least in preferred embodiments, the display item is accessible even when the elongate members are attached to the sheet element. Thus, the display item may be accessed and adjustments to its position, relative to the sheet element, made. The display item is typically a picture or photograph.

The first and second points along the edge of the sheet element are preferably at opposed corners of the sheet element. Most preferably the first and second points are at diametrically opposed corners of the sheet element. This arrangement provides particularly good support for the sheet element. The support of the display item may also be improved in this arrangement.

A plurality of elongate elements are preferably provided and, preferably, at least two of said elongate elements cross each other. The provision of additional elongate elements may provide additional support for the display item.

In a first arrangement, the at least one elongate member is a flexible strap. The at least one flexible strap is preferably made of a plastics material such as polypropylene.

At least one end of the at least one strap is preferably provided with an opening for receiving a corner of the sheet element to attach the elongate element to the edge of the sheet element. This provides a simple and effective means for attaching the strap to the sheet element.

Alternatively, at least one end of each strap may be provided with an attachment device for attaching

the strap to the edge of the sheet element. The attachment device may be an "L" or "U" shaped bracket locatable on an edge of the sheet element. The attachment device may be a hoop or "O" shaped member for attachment to the corner of the sheet element.

Preferably the at least one strap is twisted along its length. This may increase the force applied to the display item biassing it towards the sheet element and thereby improving its retention in the assembly.

In a further alternative arrangement the assembly may comprise a frame element extending around the circumference of the sheet element. An aperture is preferably formed in the frame element. The sheet element is preferably located in said aperture. Preferably, the aperture is sized to match the sheet element or is slightly bigger than the sheet element so as to leave a (preferably uniform) gap around the sheet element.

The attachment of the sheet element to the at least one elongate member preferably locates the sheet element relative to the frame element. In a preferred embodiment, at least one elongate member extends in front of the sheet element and at least one elongate member extends behind said sheet element to trap the sheet element in position.

At least one mounting element may be located on at least one of the elongate members. The mounting element preferably engages an edge of the sheet element to attach it to the elongate member. Preferably, each mounting element has an opening provided therein through which an associated elongate member extends. The sheet element is preferably also located in the opening provided in each mounting element also to attach the sheet element to the elongate member. The elongate member(s) and/or sheet member located in said opening are preferably a tight

fit to prevent the sheet member inadvertently being detached.

The mounting element is preferably rotatable about an axis perpendicular to the longitudinal axis of the elongate member to facilitate attachment of the sheet element to the elongate member.

The mounting element is preferably a hoop or a hollow truncated cone. The mounting element may simply be a metal washer.

A recess is preferably provided in the frame element to accommodate each mounting element. Advantageously the recess may also help to prevent the mounting element being displaced accidentally causing the sheet element to be detached from the elongate member.

The frame element preferably restrains the sheet element on at least two sides. The at least two sides are preferably parallel.

The sheet element is preferably co-planar with the frame element.

The elongate members may be made of any suitable flexible material. Preferably, however, the elongate member is made of wood or plastics material. The elongate member may be hollow, i.e. tubular, but is preferably solid. The elongate member is preferably a strut, e.g. a bar, rod or other suitable brace.

Preferably, a plurality of elongate members are provided.

The display item is preferably located between the sheet element and the elongate members.

The display item may be formed integrally with the sheet element, for example to form a mirror, a clock or the like. Furthermore, a light may be provided behind the sheet element. In plan form the sheet element may by a polygon, a rectangle, a circle, an ellipse or any other desired shape.

Viewed from a further aspect the present

invention provides an assembly comprising a frame element, a sheet element and a plurality of elongate members, each elongate member being attached to the edge of the sheet element at first and second points; wherein at least one elongate member extends in front of said frame element and at least one elongate member extends behind said frame element to mount said sheet element in said frame element.

Viewed from a still further aspect the present invention provides an assembly for mounting a display item, the assembly comprising a sheet element and a retaining member, the display item being locatable between the sheet element and the retaining member; wherein, in use, the retaining item is attached to the corners of the sheet element to retain the display item in position.

The sheet element described herein is preferably transparent. The sheet element is preferably substantially inflexible.

The assembly described herein is preferably provided with a stand element for supporting the display frame on a horizontal surface.

The present invention also related to a kit of parts for making an assembly as described herein. The display item is not necessarily included with the kit.

Viewed from a further aspect, the present invention provides an assembly comprising a frame element, a sheet element and at least one elongate member, wherein said at least one elongate member extends across the front of the sheet member to retain the sheet member in position relative to said frame element. The sheet element is thereby mounted on the frame element by the at least one elongate member. The at least one elongate member may each be inserted through two holes provided in the frame member on opposed sides of the sheet element to retain it in position. Preferably, if the sheet element is a

polygon, an elongate member extends across each corner of the sheet element.

Viewed from a yet still further aspect, the present invention provides a demountable assembly such that a flat or curved, generally rigid and rectangular planar element can be contained by the interaction and inter-penetration of only holed or linear element(s), and where said holed elements do not actively clamp the planar element and where the linear elements are not attached to the planar element by means of integral or separate pre-formed "hooks", (as capable of hooking onto the side edge of a planar element) but where the linear elements may be finished with toggles and may be prepared with holes (or "integral hoops"), or have holed "L" shaped elements attached, to be penetrated by other elements as required, including the corners of the planar element, and where, (being made from suitable materials) the natural tendency of the linear elements to recover from forcible deformation is used directly and/or indirectly to maintain the structural integrity of the assembly.

Viewed from a still further aspect, the present invention provides a demountable assembly comprising, generally rectangular stiff, rigid, planar element which is neither holed or otherwise adapted, being releasably attached to, at least one, linear support element capable of being forcibly deformed and naturally returning to its original form and where said linear support element(s) is deformed and stressed in order to be secured within the assembly, and where the mutual attachment of the planar element and the linear element(s) is achieved by means of either one, or both said planar and linear elements being located within hoops which are integral to the linear elements or separate and in either case they may supported by one or more other demountable elements, and where the points of attachment of the

linear element(s) to the planar element are on opposing edges or corners of said planar element as necessary for the stressed attachments to be secure.

The planar element is preferably generally transparent and where the pressure applied to said display screen by the stressing of the linear support element(s) is used to hold an item in place against the planar element so that the ensemble becomes a display system comprising, display screen, display item and linear support element(s).

An intermediary backing sheet or panel, generally equal in size or smaller than the display screen may be installed behind the display item, and between the primary linear elements and the display screen.

The backing element preferably interacts with the primary linear elements to increase the pressure applied to the rear of the display screen.

The primary linear support elements may be integral to their means of attachment.

The primary linear element(s) may be deformed by twisting and, being made of a material which will naturally attempt to return to its undeformed state, is attached to two diagonally opposing corners of the display screen by means the corners of said display screen being inserted into holes in opposite ends of the linear element and where various other elements including lugs or suckers may be optionally added for extra security, as demountable attachments.

The hooped means of attachment to the corners of the planar element is provided by a hole in an "L" shaped element (which is not capable of attaching to a flat side of the display unit).

A frame element may be provided as a means of giving support to the separate hooped attachment elements and where the primary linear elements function as a pair on the rear of the display screen passing through the hooped elements and bearing onto

the rear of the frame element being held in place if parallel to the edges of the display screen by being flexed to pass squarely into the angled opening of the hoop and being locked in a position where the effectively smaller opening in relation to the angle of the linear element causes it to bite on said linear element and where the linear support elements cross over diagonally (as generally at the rear) the resulting flexure will trap the one nearest the display unit and cause the other to "bitten" by its hooped attachments and where similarly located parallel linear elements are deployed on the front of the display screen with their ends bearing onto the frame element so that said frame element, the means of attachment, and the display unit are all trapped within the assembly.

The hooped elements are preferably placed in between the frame element and the display screen so that they and the linear support elements which they hold are prevented from sliding in relation to the frame element by using a corrugated frame element which will block said movement of at least one pair of linear support elements deployed parallel to the said corrugations.

The primary linear support structure is preferably attached to the frame element by means of being inserted, from the rear, into holes in the main plane of the frame element and being thus attached cause a flexibly responsive frame element to bow forwards, into a generally convex form, so that it supports the front section of the hooped elements, and so that the secondary linear elements which would otherwise lock into the front sections of the hoops are not required.

Alternatively, the primary linear support structure may be attached to the frame element by means of being inserted, from the front, into holes in

the main plane of the frame element and being thus attached causing a flexibly responsive frame element to bow backwards, into a generally concave form, so that it does not support the front section of the hooped elements which are located on the corners of the display screen, (and partially supported by the frame element) and so that the secondary linear elements are required to lock into the front sections of the hoops and so prevent said hoops from rotating off the corners of the display screen, but they are not required, in this embodiment, as a means of blocking the frame element in place.

In a further alternative, the primary linear support structure may be attached to the frame element by being prepared with a slot at each end which will accept the edge of the frame element, or where the frame element is prepared with a sot in the inside edge of the window aperture so that a "slidable" attachment is formed so that the linear support structure is anchored on the corners by passing through hooped elements into which the corners of the display screen are also inserted to prevent the linear support elements from sliding.

In a still further alternative the primary linear support structure may be attached to the inside edge of the aperture of the frame element, by means of being located in holes recesses, slots, cavities in the structure, or similar, (such as a plastic fluted hollow core material known as "Corex") so that the secondary linear elements are required to lock the front sections of said hoops in position, (but not as blocking elements to trap the frame element) and so the display unit can be set forwards of the frame element and the hoops being located on the corners of the display unit are able to be adequately supported by contact with the inner edge of the frame element and this contact can be made, for instance at two

points (so movement around the corner of the display unit will be resisted by either a vertical or horizontal surface) when the corner hooped element is sited in a parallel sided gap between the planar element and the inner edge of a rectangular window aperture in the frame element, (or other shape that provides adequate bearing).

The dimensioning of the display elements and the primary rear support elements in relation to the hooped elements is preferably such that the hooped element cannot rotate off the corners of the display unit whilst said display unit is held in a forwards position in relation to the contact between the hooped element and the rear of the primary linear support element so that the arc of rotation is interrupted by the angled section of a frame element with angled corners in the shape of the window aperlure and subsequent rotation about this point as a fulcrum will be a shorter radius and will not pass the corner of the display unit; but the hoop will rotate past the corner of the display unit, for the purposes of assembly and demounting by means of the application of a force to bring the rear linear support element closer to the display unit.

A flat planar item such as a photograph, may be inserted to be clamped by other elements behind the planar element/display screen by siding said item into any of four "open" sides, providing the width the opening between the points of attachment is big enough.

The linear elements may be made from significantly rubberized or elastic materials so that with obvious adaptions to the versions described the linear elements may be tensioned and optionally amalgamated into one or more linear support elements, capable if taut enough, of performing the same blocking role in respect of other elements, in the

same positions as is usual for the linear elements.

The assembly may be adapted for mounting on a vertical surface. The assembly is preferably adapted so that the planar element/display screen is parallel to the vertical surface.

Alternatively, the assembly may be adapted so that it stands generally upright on a horizontal surface. The assembly is preferably self-supporting on a horizontal surface, without need for a strut.

Preferred embodiments of the present invention will now be described by way of example only and with reference to the accompanying drawings, in which:

Figures 1a and 1b show the flexible straps for retaining a display item in position in a first embodiment of the present invention;

Figures 2a and 2b show a side and rear view of the first embodiment of the present invention with the flexible straps showing Figures 1a and 1b in position;

Figures 3a and 3b show rear and side views of a free standing version of the embodiment shown in Figures 2a and 2b;

Figures 4 and 5 show front and rear views of a second embodiment of the present invention;

Figures 6 and 7 show a modified version of the embodiment shown in Figures 4 and 5 adapted to be hung on a wall;

Figure 8 shows a free standing version of the second embodiment of the present invention shown in Figures 4 and 5;

Figure 9 shows a modified version of the second embodiment shown in Figures 4 and 5 having an adapted corner support member;

Figures 10 and 11 show a third embodiment of the present invention having holes in a frame element to receive the diagonally extending elongate members;

Figures 12 and 13 show wall hanging and free standing versions respectively of the third embodiment

of the present invention;

Figures 14 and 15 show front and rear views of a further modified arrangement of the third embodiment of the present invention for hanging on a wall;

Figures 16 and 17 show plan and side views of a further modified version of the third embodiment of the present invention;

Figure 18 shows a fourth embodiment of the present invention having hollow truncated cone members to retain the sheet element in position;

Figure 19 shows a cross section through one of the hollow truncated cone members used in the embodiment shown in Figure 18;

Figure 20 shows a cross sectional view of a corner mounted hoop retaining member of a fifth embodiment of the present invention in first and second positions;

Figure 21 shows a horizontal cross sectional view through the fifth embodiment of the present invention;

Figure 22 shows a rear view of the fifth embodiment of the present invention;

Figure 23 shows a side view of a free standing version of the fifth embodiment of the present invention;

Figures 24 and 25 show the rear view of alternative arrangements of the second embodiment of the present invention;

Figure 26 shows a sixth embodiment of the present invention having retaining members integrally formed from the frame element;

Figure 27 shows a seventh embodiment of the present invention;

Figures 28 to 32 show alternative arrangements (a) and (b) of an eighth embodiment of the present invention;

Figure 33 shows a rear landscape view of an eighth embodiment of the present invention;

Figure 34 shows a further view of the eighth embodiment of the invention;

Figure 35 shows a rear view of a free standing version of the eighth embodiment of the present invention; and

Figure 36 shows a side view of the arrangement shown in Figure 35.

As shown in Figures 1a, 1b, 2a and 2b, a display unit 1 comprises a planar element 2, made of a generally stiff, resilient or rigid material (and generally transparent to function as a display screen) and normally two (but at least one) primary stressed structural member(s) 5b held between hooped points of contact with, normally, all four (at least two opposing) corners of the planar element(s) (which may comprise more than one similar element), so that their attempt to regain an unstressed form renders them secure.

By reducing the frame to a harness which engages the corners of the display screen 2, the appearance is comparable to the known "clip-frame". As this frame uses diagonal tensioning between corners to hold the display screen, a backing board (which has a structural function in clip-frames) is no longer required. A backing sheet may be used for protection or decorative reasons. The twisting of the straps 5b to create tension also applies pressure to the back of a display item 17 holding it in place against the screen. Importantly, it also gives space for a wall pin to engage with the central hanging hole 10 so that the ensemble hangs parallel to the wall from its centre of gravity.

The system is easily adapted to make a table-top version, as shown in Figures 3a and 3b. An "L" shaped strut 19 is provided which is attached at the bottom end by means of a sucker 21 to the margin of the display screen 2, while the upper end locates in the

hanging hole (or sits in the cleft under the two straps). In the preferred version the strut 19 is made from plastic tubing with a concertina joint. A drinking-straw, trimmed as necessary, is suitable for this purpose and can be tightly fitted to the sucker 21 by wetting. The sucker used has a nipple which helps to secure the connection, and glue may also be applied. A "V" cut in the top of the tube enables it to rest in the hanging hole without penetrating further but other cuts such as a vertical slot in the tube work well as the tube can then be squeezed into place.

Polypropylene is considered the mst suitable material for the straps 5b and twisting by 720 degrees is preferred though 360 is also possible. Ideally the straps should be twisted in opposite directions to achieve visual symmetry as shown in Figure 2b, though this is not a functional requirement. Glass is not considered to be appropriate for the display screen for safety reasons (unless safety glass), so "perspex" or similar is preferred.

Proposed safety enhancements are in the form of hemispherical beads at the corners of the display screen 2 to help stop the straps 5b from being accidentally pushed off. These could be spheres located, e.g. adhered, within a hemispherical socket. Also the straps 5b can be inconspicuously glued to the thin edges of the display screen 2 as an extra precaution. Further attachments could be added to the corners to act as buffers in case of accident.

A version of the display unit 1 for mounting on glazed or shiny surfaces is achieved by suckers being located in extra holes 10b, 10c in the straps or a larger sucker in the central hanging hole 10. A lighter weight version is proposed for use on fridge doors due to the dynamic loads in this instance. The standard version may have the extra holes 10b, 10c to

meet this possibility. The display unit 1 is designed to accommodate decorative margin strips held in place as the displayed material itself is, by twists in the straps 5b, or equally to be adapted to a "sandwich" form where the displayed material is protected by a backing sheet or board (which may also be transparent and need not be as big as the display screen or have rectangular edges.) It is clear that the system achieves minimal functionality with only one diagonal tensioned strap 5b but this is not the preferred version.

Though not necessary for structural stability, other elements, such as suckers for instance, can be added for extra functional security, with regard to applied forces, in the case of the hoops being integral to the stressed primary members 5b. If the hooped (or otherwise holed elements) 31 are separate from the primary members then other elements and / or mechanisms are necessarily attached to render said hooped elements 31 stable.

Foremost of these is the frame element 33 which prevents the hoops 31 from sliding off but this in turn needs to be secured by the extension of the primary members 27,29 to overlap the frame element 33 and by another pair of structural members 23,25 on the opposite side of the assembly, also over-lapping the frame element 33, (and acting as bolts with respect to possible rotation of the hoop elements 31) or by means of the primary members 56 being attached to the frame element 33 directly by various means with different versions arising from the means of (demountable) attachment used.

The embodiment shown in Figures 1 to 3 does not use a framing element 33, achieving the above functions, by means of two twisted straps of resilient material 5b, with integral holes provided, to enable these straps 5b to be pulled onto the corners of the

display screen 2.

The attachment of the integral hoops is vulnerable to removal by applied force and is also subject to the torsional stress in the strap 5b compounded by local stress as the strap 5b is pulled over the corner of the display screen. The addition of suckers placed under the straps 5b, next to the corner, will itself be secured (as suckers alone were found to be unreliable) and control the stress on the strap 5b at the corner and be present a means of attachment for other elements such as stiff hoops or frame elements to reduce vulnerability of the connections of the main members at the at the corners. In fact the resilience of suckers (with a "nipple" top) means that stiff hoops may be attached and located on the corners of the display screen as the primary, or only, means of attachment. Leverage upwards on the "nipple" will tend to dislodge the sucker which needs to be resisted by the means of connecting to elements anchored in their relative position by means of the planar element. Though the sucker's prime function is to enable a hoop to attach to the display screen 2 at an angle without suction, would be effective The resilience which is characteristic of the suckers can alternatively be provided by other element(s) in the assembly, since it is required as the means of attachment to "close" the assembly over the display screen 2 which can itself be the resilient element.

Multiples can be made, for example, by linking rods penetrating slots or holes in the rear straps 5b to produce a locating torsion to resist gravity.

A demountable scaffold and framing structure capable of supporting the necessary functional elements may be provided to operate as a display frame. The prime task is to support a generally rectangular planar element or "display screen" 2, but

the invention is a structural system with potentially wider applications.

The embodiment shown in Figures 4-9 uses a planar frame element 33. The display screen 2 is held in place by means of rods 23,25,27,29, or other linear elements such as ties, which pass through "hoops" 31, in fact in the form of standard washers, which are placed between the display screen 2 and the frame element 33 such that the rod ends bear on the front and rear surfaces of the frame element 33. The rods 23,25,27,29 may be vertical or horizontal and in the case of the rear rods 27,29 also diagonal as is generally the case but can also be the same as the front rods 23,25 to align with decorative corrugations in the frame element 33. Rear rods 27,29 can support/attach to a decorative sheath folded around the main frame element 33 as shown in the drawings. This folded sheath form can also replace the frame element 33.

The rear rods 27,29 are placed diagonally in order to be effective, partially owing to their crossover, in applying pressure to the rear for location of the display item 17, but may also be parallel. The flexure of the rear rods 27,29, possibly over or through a backing panel, visible/decorative or otherwise, serves to keep them in place, whilst a pair of front rods 23,25 is flexed for insertion into the hoops' 31 maximum "face on" radius to be gripped by the smaller radius presented by the hoop when the rods 23,25 are in place parallel to the edges of the display screen 2. Hoops 31 need not be diagonally holding the display screen 2 but may be restrained from lateral or vertical movement by the rods 23,25,27,29 in them being blocked by meeting corrugations or obstacles in the frame element 33. However, the preferred position for the hoops 31 is at the corners where they also hold the corners of

display screen 2 within their openings.

The frame element 33 can prevent movement of the rods 23,25,27,29 simply by an all around gap between the display screen 2 and the frame element 33 being the minimum necessary to accommodate the rims of the hoops 31 so that they cannot rotate, since one rim will be blocked by the frame element 33.

Other arrangements are possible providing only that the hoops 31 are supported. The preferred version uses an angled internal corner to the frame element 33. The outer edge is open to variation and the plane of the frame element 33 may be distorted or curved for decorative or functional reasons, such as being free standing. A strut can be provided at the rear and adaptations for hanging as shown in the drawings.

A disadvantage of this basic version is that the assembly is unstable during construction; this is mitigated by using elastic bands pulled around the frame element and other elements. In response to this consideration subsequent versions were developed. The common feature of these versions is that at least one pair of rods, generally at the rear, is attached to the frame element thus creating a "jig".

Shown in Figure 4 and 5 is a demountable scaffold structure 22 such that one pair of parallel rods 23,25 is held in place with another pair of rods 27,29 at 90 degrees or 45 degrees to the first pair of rods 23,25 by four rigid hoops 31 whose internal diameter is gauged to accommodate two such rods or two such rods and an intermediate planar element(s), such as the display screen 2. The construction is stable except that the hoops 31 can rotate to a position where they do not hold the elements. The hoops 31 preferably rotate about an axis parallel with the plane of the display screen 2. More preferably, the axis of rotation of the hoops 31 is in the plane of the display screen 2.

In the embodiments shown in Figures 4 to 9 the rods 23,25,27,29 are slid into position to enable their extended ends to be used to securely sandwich a framing element 33 located within the bearing area under the rod ends and dimensioned to fit the planar element and/or the limit defined by the hoops 31; the hoops 31 are thus held in position by the framing element 33.

Furthermore, since the sliding action of the rods 23,25,27,29 is easier in a direction at 90 degrees to the hoops 31 as their effective aperture size is greater when not reduced by the thickness of the hoops 31 impacting at 45 degrees; (optionally) flexing the rods 23,25,27,29 into position thus results in a spring locking mechanism, so that orthogonal rods 23,25 will not simply slide out and so reducing the necessary bearing.

As shown in Figure 9, the elongate member may extend inwardly from the frame element 33 and need not extend fully across the planar element. Rather the elongate member extends inwardly sufficiently only to support the corners of the display item.

A further embodiment is shown in Figures 10 to 17. In this embodiment one pair of rods 27,29 is attached to the framing element 33, by sliding into holes in said framing element 33 so as to curve the frame element away from the bearing points to make a free standing ,or decorative structure. Curving of the frame elements 33, partly caused by the angled penetration of the rods 27,29, can be augmented by elasticated hoops 18 located to span vertically between the extended ends of the diagonal rods 27,29 on the rear, as shown in Figures 10 and 11. It is important that the hoops 31 are also supported on the front by rods 23,25 locked into them, since they are only partially supported at the rear. The overall effect is thus concave.

A hanging hole 10 can be provided in the upper flange and as shown in the embodiment shown in Figures 10 to 17 can be concealed within the naturally occurring gap behind the decorative sheath, and the same applies for a hole or tongue in the bottom flange to take one end of a tubular "L" shaped strut for table-top use. This strut 19 can be a trimmed drinking straw, also adapted at the other end, to engage the cleft between the rear rods 27,29.

Being of light weight the invention is suited to adaption by means of suckers attached in holes or in the gap between framing element 33 and display screen 2, facing forwards or back, to mount on appropriate surfaces.

The system can be extended to make multiples, vertically, horizontally, and in combination.

Self-assembly for the embodiment shown in Figures 10 to 17 can be as follows:

The rear diagonal rods 27,29, are inserted diagonally into the holes 35, in the backing sheet 37, to form a unit.

The decorative sheath, and framing element 33, are placed together. The rod ends are then placed in the corresponding holes, in the decorative sheath, and frame element 33, with hoops 31, already attached to each one. The flaps, of the decorative sheath are folded back into place, with the inner flap under the outer flap, and they are held in pace by being under the ends of the rear diagonal rods. This unit is secured by elasticated elements 18 looped around the vertical pairs of rod ends.

The display screen 2, is placed in the frame aperture. The hoops 31, are placed on the corners of the display screen 2 where they are partially restrained by the frame element 33. The front rods 23,25 are located in one hoop 31 by sliding directly towards the hoop 31 and the flexed to meet the second

hoop and carefully eased into the hoop in a straight form, in the orthogonal position, (vertically as a matter of preference.)

The displayed material, can be slid into place under the backing sheet 37, optionally leaving a transparent margin.

A rear support strut 19, can be attached for table top use, or suckers can be added if required.

All versions can be adapted with elasticated (finished with toggles), part elasticated or other taut flexible linear elements performing the blocking function normally taken by the rods. Such tautness can be achieved by for instance twisting bands of resilient or flexible material, as shown in Figures 1 to 3. Other means are also possible. Flexibility of rod elements is desirable but not essential. The prototypes use boxwood of square section. Other sections are possible.

Tongue extensions of the frame element 33 are also possible adaptive means of securing the hoops 31 by being placed in said hoops 31. The hoops may be custom or standard metal washer form.

The frame element 33 may be of multi-hole construction or lattice structure as a means of providing holes for rods 23,25,17,29. It can be made of rigid, stiff, or flexible materials, including plastics and foams. The outside edge can be of any configuration. It can also deform in the third dimension providing necessary bearing points have been met.

The decorative sheath can be any sheet material but if corrugated will fold over edges in a restricted way that will also restrict deformations of the frame element in a generally desirable way.

The shape of the cut-out frame aperture is designed to meet the outside edges of the display unit 1 and/or the attached washers.

The proportions and scale of the invention are open variables.

A further embodiment is shown in Figures 18 and 19. As an alternative to the locking action of the front rods 23,25 a custom hoop 39 can be designed in the form of a cone (with normal base and located as usual) so that resistance offered by the rear of the cone against the framing element 33 will prevent it from becoming dysfunctional, by rotating about its diameter. It can also be customised to incorporate the rods 27,29 located in it, if made of resilient plastic material. The form is otherwise similar to the embodiment shown in Figures 10 to 17.

The role of the front rods can be taken by the framing element 33 being in a forward position to support the critical side of the hoop, providing again that the rear rods 27,29 are located in holes 41 in the framing element 33 (or otherwise affixed.) The overall effect is thus convex.

In the embodiments shown in Figures 10-19 the frame element 33 provided with holes or recesses into which the rods 23,25,27,29, with hoops 31 attached, are located, by sliding, or flexing in the case of recesses. The hoops 31 are then placed over the corners of the display screen 2, and front rods 23,25 can be inserted to function as bolts. Depending on whether the rods penetrate the frame element 33 from the rear or front the frame will be subjected to pressure to become concave or convex.

Custom hoops 39 can be used to ensure they are still supported by the frame element 33 (in spite of curvature), and so the front rods are not required.

In terms of the structures meeting the requirements of display frames preferred embodiments comprising planar element 2, should be generally rectangular and generally transparent to function as a

display screen 2, a backing sheet 7, can be provided either the full size of the display screen 2, also held in the hoops or smaller, supported by rear rods, and if attached onto said rods by means of holes in the backing sheet 37 then it can also apply dynamic pressure to the displayed material.

A decorative sheath 11, can be placed on and folded around the frame element 1, such that its folds are held on by the scaffold rods 4,5.

The embodiment shown in Figure 20 which involves the rear pressure supplied by "rear" mounted structural members to also maintain hoops 31 in a forward position where they will not simply rotate off the corners of the planar element 2, (since the frame element 33 provides a fulcrum) while the frame element's connection to the rear support structure also prevents the hoops 31 from sliding off the corners of the planar element 2 completely. This extra mechanism replaces the front bolting members as featured in other versions (or renders them optional). Other means can be found to maximise the pressure provided by the rear support members such as both passing over a rear backing panel/packing element, and pre-forming them into a curved shape which has to be stressed into a flatter mode to fit into the hoops at both ends. The mechanism can operate with pressure from any source including deformations due to pre-stressing, wedges and so on.

The present invention uses a one piece frame element 33 capable of restraining the display screen 2 on at least two parallel sides , (at least in the forwards direction relative to the frame element), and uses rods on the other side (ie. normally the rear) to block backward movement since the rod ends are located in holes in the structure of the frame element 33. The frame element 33 could be drilled to provide these holes but using a linear box structure such as the

polypropylene sheet known as "Corex" provides integral hollow tubes into which the rods can be inserted. In fact instead of two parallel rods being used four shorter lengths as "pegs" could be used also pressing the display screen 2 forward onto the frame (specifically the forward flap on the inside edge of the frame aperture), but this is not preferred. Either rods (or pegs) thus provide pressure to secure the displayed material against the display screen 2.

Equally, these rods can be placed diagonally, such that their ends are still located in the flutes of the "Corex" , in the corners of the window aperture. This requires that the rods are resiliently flexible so that they can be flexed to fit , and restraighten into the fixed position. Non-resilient flexing also works but is not preferred.

Using Corex also provides a simple way of locating the display screen 2 within the frame aperture since a grooved slot can be achieved on two parallel edges of the window aperture so that the display screen 2 can be inserted. The alternative is to angle cut the window edge in a solid material.

This requires either some elasticity in the material (which is limited in Corex as found) and/or a bendable display screen 2, and/or that the sides of the groove are designed as resiliently flexible flaps. So to make for easier access for a stiff display screen 2, at least one or two ends of the flap sides of the groove are cut away so widening the window aperture to form an access slot, (i.e. so that the aperture form narrows to form the grooves). The display screen 2 can thus be inserted in a parallel motion. Depending on tolerances in the relative thicknesses of the display screen 2 and the depth of the groove flexible plastic glass further helps in feeding the display screen 2 into the combined slot created by both sides of the framing element 33 acting

together.

The access slot can be expressed as a void at the top and bottom of the display screen 2, as in the illustrated version and the rods can be used to secure decorative components exposed contained within the slot, e.g. coloured twisted ribbon elements or rods can be fitted into the groove so that their ends are held by the flaps. The shape of the display screen 2 itself, given a square as the display area will be a rectangle, ie. to achieve the bearing overlap.

However, a resiliently flexible display screen 2, can be flexed so that it can be inserted directly into the window aperture which can be a simple rectangle without need for the widened section described above. The window aperture is cut into the Corex so that two opposite sides of the opening provide grooves in the remainder of the flute structure, into which the display screen 2 is inserted.

Thus the preferred embodiment of the invention uses diagonally deployed rods 27,29 at the rear and a simply parallel sided window aperture.

Slotting edge flutes by cutting one face of the Corex material enables a rod of approximately equal diameter to the flute width to be more easily inserted into the flutes. This detail is used to create "feet and finials" at the corners of the frame and causes the edges to curve forwards (or backwards if so deployed). A similar detail in a fold out flap in the bottom of a Corex backing panel can be used to accommodate a shorter central rod(with an optionally angled lower end) so that it forms a rear support for table-top use. The thickness of the Corex backing sheet serves to engage both rear diagonal rods in applying pressure but diagonal slots in the backing sheet will alleviate some pressure and help to keep the backing sheet in the right position.

An optional empty margin around the displayed material visually exposes the diagonal rods and allows for larger material to be displayed within the same frame. This margin can be cut out to form a smaller additional frame element 33 operating in the same way. It is envisaged that multiple units can be made by extension of the orthogonal edge rods for both sizes of frame created by the above cut out process ; the smaller frames being preferred.

Alternatively the central cut-out section can be left in place and optionally rotated in a square version to provide a decorative effect or, if dimensioned to fit tightly into the window aperture to function as an alternative to the structure provided by the rods, i.e. the vertical and horizontal dimensions of the cut-out panel/ aperture should be slightly different so that when rotated the fit is imperfect, or cuts in the panel so it can be opened up to marginally increase its effective width possibly with rods inserted to act as wedges, will have the same effect of locating the central panel against the edges of the frame element 33.

A decorative additional frame element can be achieved by a separate flat sheet material of similar size to the combined frame and cut-out: the outer edges are folded inwards to form a 3D frame whose inner edge is tucked under the flaps at the sides and also at the top, by means of extended "lugs" into the flutes. The central cut-out area is available for use as a (coloured) backing in the transparent margin area or other use, such as a backing panel to the small supplementary frame. Flat decorative strips can also be placed in the transparent margin, being held in place by the rods and/or frame element.

While elasticated hoops do not provide stable attachments, linear structural members which use their elasticity to secure themselves, can, if sufficiently

taut, generally perform their necessary blocking and support functions well enough not to be excluded as possible embodiments of the invention, and can be achieved by someone with appropriate knowledge in ways other than as shown in the drawing as an example. In fact ties of any kind can be used, providing tautness can be achieved as for instance with springs (inter-linking strings, straps, stiff rods, or other elements.) Where the resilience necessary for demountable assembly is provided elsewhere, the connecting member, between hoops may also be rigid, or stiff. The embodiments as described generally use resilient primary (and secondary members) and are referred to as "rods".

Resilience of the planar element (generally described as the display screen 2, but can also be the displayed item itself), will result in counter flexing of that element which is structurally acceptable but generally not functionally preferred. The definitive conditions of the invention assume that the planar element can be rigid, as a flexible planar element can be inserted directly into a frame element 33.

Any resilient element can also be pre-formed into a curve so that their deformation into a straighter form will apply pressure instead of by deforming a "flat" resilient member. Other elements may need to be adapted to fit these pre-formed elements.

Multiples can be made in generally obvious ways and ways set out in relation to specific embodiments described below, and as may be applied to other embodiments.

The rear pressure is also used for the location of the display item in the case of a "display frame," and the primary rear members also provide the basis for hanging vertically, and horizontal support.

The display screen 2 is not holed, but assumes a generally rectangular geometry, or other shapes made

to provide necessary "tongues" in place of rectangular corners, as may be contained by hoops, or the frame element 33 where present. In all cases the assemblage requires no gluing, welding, screws, nails or other permanent fixing. Another common feature is the ability to hang parallel to the wall, partly as a safety feature as this helps to protect hoops being dislodged by contact with the wall.

Multiples are generally possible with frame extensions, continuous backing sheets, and/or extension rods to link units together.

A further embodiment comprises front and rear rods 23,25,27,29 which attach to the inside edge of the frame element 33 by means of slots or clefts in the ends of the rods 23,25,27,29 such that the frame element 33 can be located within them. Since the rods 23,25,27,29 would, in principle, be able to slide in relation to the frame element 33 they are passed through hooped elements 31 attached to the corners of the display screen 2 as usual, and they are prevented from rotating within the location slot, which is simply the same width as the minimum need to accommodate the hoops in their angled position. There is no need for the window aperture of the frame element 33 to have an angled corner to support the hoop 31. The gap between the display screen 2 and the frame element 33 is such that the rods 23,25,27,29 can meet the frame element 33 in such a way that it can be rigid and not needing to deform to meet the rods 23,25,27,29 but the rods will generally need to flex, (unless non-central end slots in large diameter rods and/or a flexible frame element.) Rear rods 27,29 can still be diagonal or horizontal. Alternatively, hoops 31 are integral folded sections of frame element 33 placed as usual.

A perceived improvement is for the rods 23,25,27,29 to attach directly to the inside edge of

the display screen 2 either by being accommodated within it and being unable to slide so that a fluted frame structure could be used. Rods 23,25,27,29 prepared with a groove in the ends can locate onto the inside edge of the frame element 33 by resiliently flexing. Though they may be tight fitting in principle they can slide, this can be prevented by using a corrugated material for the frame element 33 preventing sliding in the most critical direction, and/or using a corner hoop as in previous versions. A parallel sided gap, of minimum width to accommodate the hoops 31 on the corners of the display screen 2, is adequate to ensure the hoops 31 cannot rotate off and this gap allows space for the rods to deviate from the faces of the display screen 2 to meet the inside edge of the frame element 33, without the frame element needing to deform, as is generally the case when rods are located in holes in the front and rear of the frame element 33. It follows that the frame element 33 can be rigid in this version. To apply rear pressure for location of the display item 17, said item must be large enough to be supported by the rear rods on the edge of the display screen 2 or use a backing element generally as large as the display screen 2 to transfer the pressure.

However, in the embodiment shown in Figures 20 to 23 curvature of the frame element 33 is less of a problem as the rear rods 27,29 are located in holes/recesses in the inside edge of the frame element 33. Indeed the possible core (or laminate) structure of the frame, to present edge "holes", is likely to give extra stiffness to the frame element 33.

Releasable security for the placement of the hoops 31 on the corners of the display screen 2 is thus provided by a mechanism which can be simply described as rear pressure holding the display screen

2 in a position relative to the hoops 31 such that they may be attached or released by countering that pressure. While a clip frame uses recesses in the backing board to lock the clips in place the current invention blocks removal of the corner hoops with the frame element.

More specifically, forwards pressure generated by rear rods 27,29 or stressed backing panel causes the display frame 1 to be located as far forwards as possible within the hoops 31 so that the angled inside edge of the display frame becomes the fulcrum for rotation of the hoop is so that the rotation radius is too short for the corner of the display frame to escape the hoop. Continued application of force, pushes the hoop till the rear rim meets the rear rod at a point still further away from the corner and so rotation about this point also fails to remove the hoop, unless the hoop is raised, as is generally not the case.

In order to rotate the hoop onto the corner of the display frame, during assembly, it is necessary to position it adjacent to the angled edge of the frame element and press from behind so that the display screen no longer maintains its forward relative position in which it blocked rotation of the hoop. The point of contact of the bottom rim of the hoop, with the rear rod will become a fulcrum, and giving the full diameter of the hoop opening as a rotational radius, which will cleanly pass the display screen. The mechanism could be described as a "restricted rotation mechanism".

The hoops 31 have been found to be secure in practice, as well as easy to attach if lifted into position as described.

To achieve the above variant it is possible to use a hollow core plastic material known as Corex.

When cut this material will expose its hollow flute structure to provide holes in the edges of the frame element 33 into which the (resilient) rods can be securely placed by flexing.

The backing sheet can be made of the same material, from the frame aperture. If rotated to an angle corresponding to that of the diagonal of the rectangle defined by the display (square or photo for instance) then one diagonal rear rod 27 can be placed within it , while the other rod 29 provides extra pressure by passing over the backing panel 37. To stop the panel sliding up along the flute when subject to self-weight in hanging mode, one or more elements such as standard metal paper clips can be inserted via slots in the flute to exert pressure on the rod within. A central paper clip can be distorted to extend vertically to make a hanging hoop, as well as hooking over the second rear rod. Edges of the backing panel 37 can be folded up to provide spacers for parallel hanging, and these can be angled inwards by means of an elasticated element hooped around the exposed edges of the flaps, being partially resisted by the resilience of the material in achieving the folded position. Dye-cutting technology may obviate the need for an elastic element, and the inward angle is not necessary except to minimise visual impact from the front.

A vertical fold and cut in the lower flap will enable a section to be folded up to form a secondary flap so that a strut dimensioned to forcibly fit into a flute will extend downwards and outwards to enable the frame to be set on a horizontal surface. The top of the folded section can meet the bottom of the central paper clip, or one inserted and twisted, as necessary, and the end of the strut can be chamfered to meet the surface, to maximise stability.

Using Corex presents the possibility of applying

both front and rear rods 27,29 directly into available flute ends, parallel or diagonally, so removing the need for hoops. In fact, in practice the flute size was found to be subject to variability which can significantly reduce the bearing in the case of rods being diagonal. Using hoops helps to mitigate in this respect, as for instance a mis-aligned rod (owing to an unfortunate position of a flute wall) can still be accommodated within the hoop, thus giving extra security for a compromised rod end.

It may be necessary therefore, in manufacture, to co-ordinate the window with the flute spacing so as to avoid this problem as far as possible. The display screen 2 can itself be located into the flute structure and mediated by hoops, optionally supported by rear/front rods, but this relies on elasticity within the Corex to insert opposite corners and as such, is not preferred. Equally flexibility of the display screen will enable it to be inserted directly into grooves in the frame element 33, created by cutting along the flutes in the Corex structure. As an alternative to Corex the frame element may be fabricated as a laminate, for instance, or any other way that will provide necessary recesses for the assembly to be completed.

Other versions are proposed where, again, the rods pass directly into holes in the front and rear of a resilient frame element 33. Such holes will generally be near the corners of the display screen 2 but may be part of a lattice structure, or repetitive pattern. Holes may also be made in flaps in the frame element to accommodate rods or the corners of the display screen 2 itself ,or both, (and said flaps may be resistant due to the resilience of the material.)

The rods are primary pressure providing elements and generally made of a resilient material such as wood or plastic, but with obvious adaptations where

necessary elastic materials can be used as the effects of the resilience of the rods can be recreated elastically and blocking functions may also be adequately met. Rear rods are generally "primary" and may thus be larger than the front rods which act as bolts. In the embodiment shown in Figures 20-23 they must be strong enough for their resistance to bending to provide enough forwards pressure to hold the display screen 2 in a position where the corners will block rotational release of the corner hoops 31. In the embodiment shown in Figures 20-23 the combined depth of the rear rod and the display screen 2 (plus any intervening backing sheet 37 at the corner) must fit inside the hoop 31 at the critical angle to allow it to rotate and such that surplus space as exists can be taken up by the mechanism keeping it in a position at the back of the display screen where it will not enable the hoop to be slipped off. The cross section is not critical. A round section at the rear and a smaller square section is preferred for the simple version, within the frame element 33. Such rods 27,29 need not pass through the hoops 31 but may pass into the frame element 33 directly or even to the opposite side of the frame element 33 through the gap between the display screen 2 and the frame element 33.

Instead of being parallel or diagonal the rear rods 27,29 could each describe a semicircular shape or any shape which permits their usual function.

Instead of generating pressure by flexing over each other, or a backing panel ,or other element, or causing a holed backing sheet 37 in resilient material to flex, the rear rods 27,29 may be pre-formed as bent resilient elements, also then able to apply pressure to the rear as they are straightened into position.

Rods 27,29 may also be adapted with an impediment to the unintended movement of the hoop elements 31. A pin for instance, may be inserted into the rod 27,29

behind the hoop element 31 to stop so that its head stops the hoop 31 rotating off the corner of the display screen 2, even when pressure as would otherwise release it is applied, and this pin may have known (or other) means of itself being secured.

The display screen 2 is generally transparent (unless a mirror, or other display such as a clock, or lamp diffuser), generally stiff or rigid (may be flexible but then tending to reduce security), generally rectangular but other regular or irregular shapes are possible, with a suitably adapted frame element 33 giving necessary support to hoops 31 (if used). Clearly the embodiments shown in Figures 1-3 and Figures 20-23 respectively, require hoops 31 to be located onto the display screen itself 2, yet other versions can use a circular display screen held by rods located in hoops which do not locate on the display screen directly.

In theory a pre-formed, curved, display screen could be used to trap the display item when flexed to a flatter form and so secure itself within the frame directly or within hoops rotated onto corners. Extra security could be provided, for instance, by small clips attached to the corners of the display screen, outside the hoops to resist removal of the hoops and the display screen can also be adapted with a built in impediment at the corner.

The hoop may be a standard washer. The standard washer form is suitable with rigid material providing greatest security but risk of damage to display screen so less harsh, stiff materials would be suitable also. Excess elasticity can result in insecurity /instability. Resilience in the case of the integral hoop/strap element in the first variant is necessary. Front rods acting as bolts will cause the hoops to sit in a generally more upright position; otherwise they "lock" at angle inclined away from the centre of the

ensemble (as their rotation about a horizontal diagonal axis fails to clear the corner of the display screen.

Note that in the embodiment shown in Figures 20-23 that inner rims of the hoops 31 lock, at two points, with the diverging sides of the display screen 2, so this contact occurs non-axially. The hoop 31 restricted by rod 27,29 is, in fact, locked onto the display screen 2.

The backing panel(s) / sheets 37 may include a secondary decorative sheet (or strips) visible in the transparent margin. May have a role in directly applying pressure, by flexure, for display item location (or display frame gripping mechanism, as described), in which case a resilient material should be used. A pre-formed bent sheet of material able to apply pressure when straightened into place in the hoops 31 or frame element 33 can also be used to apply pressure for both location of the display item and to support any mechanism used to releasably hold the display screen. The hanging system can then be integral to said backing sheet or otherwise affixed to it. The backing sheet may also be clear/translucent of a material the same or similar to the display screen 2. It may be the same material as the frame element 33 such as Corex, and thus made from the cut out material, possibly realigned. Flaps in the backing panel (or other attachments, such as suckers,) can ensure parallel hanging on walls and an adapted flap enables a strut to be deployed at the necessary angle. It is a feature of the design that the backing panel (if any) need not be prepared with any means (such as holes, grooves etc.) which are necessary for securing clips, as is the case with known clip frames. The invention meets function by diametrically opposing forces proved either by a stressed tensile tie or by the resistance of the frame element also operating

diametrically, as well as supporting the mechanism involved in securing hoops onto the display frame in version 4.

Note that the invention can generally function without any backing sheet 37 as rear rods 27,29 or ties, themselves provide pressure for location of the display item 17 and other elements can provide means for hanging, (also provided by the cleft between diagonal rods) and parallel wall hanging.

The frame element 33 can be simply a sheet with slots (for location of hoops 31,) or holes (for front and/or rear rods), and preferably a means of access to adjust the position of the display item 17 behind the display screen 2. In preferred versions the frame element 33 has a window cut out from a resilient material.

In principle the frame element 33 is rigid and is involved in supplying a diametrically opposing force (directly or as a resultant) to resist a displacement force on the corner hoops. It may however adopt a curved form. (see below).

Optional holes are provided in the corners or in the internal edges of the frame aperture. As such these may be provided using a hollow core fluted structure such as Corex which presents holes when cut across the grain. These holes allow the display screen 2 to be supported outside of the plane of the frame element 33, and also to be gripped by a mechanism. As anchor points for supporting rods they also help in the assembly process. However, a simple version uses a frame element which requires only the principal window aperture in the frame element.

The frame element 33 can be made of virtually any material and is essentially planar, but may be curved (pre-formed) or bent, and held in a flexed position by elements within the assemblage such as struts (mounted for instance as the rear support strut or rods or

straps acting as ties. A curved form may be achieved by aligning the Corex flutes horizontally and placing a pre-curved rod element within flute(s). A length of stiff wire possibly hidden in a decorative tube (such as a drinking straw) would function as required. Slots cut in the Corex flutes would enable it to adopt a curved form with flutes running vertically but this is not preferred, (as a greater degree of natural flexibility runs with the grain).

Both the inner and outer edges of the frame element, providing hoops are supported, so that it can have curved edges; it can be a circle, ellipse and many other shapes, including for instance irregular curves across the grain, and straight sides with the grain, or "s" shapes for example, on all sides.

Holes or a "treasury tag" (with toggles inserted into the Corex flutes) can be used to provide a hanging facility, but the preferred system is to use a standard metal paper clip inserted into a central flute where as in the embodiment shown in Figures 20-23, it also provides pressure to help secure the backing sheet, and can also trap the second rear rod as it twists up to the central hanging point. It can be removed to relieve pressure during replacement of the display item.

It will also restrain the top of a folded flap housing the strut used when self-supporting and can be twisted to improve this function, (or of course another hoop instead.) It can also help secure the strut when in a stored position. Extra clips can be used for extra pressure as required.

A straight strut, preferably with a chamfered end to make contact with the tabletop, can be forcibly housed in the Corex structure in flutes in a secondary flap in the backing panel, angled outwards and downwards, as shown. The changing exposed can be simply adjusted to change the inclined angle of the

frame.

Similar struts can be used to push the central section of the frame element back so that the frame becomes self supporting.

This can also be achieved by other means such as pre-curved stiff elements being inserted into flutes arranged horizontally, and other means such as large rods wedged between display screen and frame element.

Alternatively the frame-like zone corresponding to the transparent margin can be released to make a new frame, smaller than its "parent" and with angled corners, being suitable for use as an economy version or inclusion in a multi-frame, by means of rods run through the Corex to join units together in linear or chequer board patterns. It is also possible to join units together by means of a continuous backing sheet. Rods of circular section may be inserted into the flutes prepared with slots more easily and held in place by the resilience of the plastic flaps so formed. The panels thus created can be interlocked (also by creating a standard hinge structure) to form folding screens, box style lamps, waste paper bins etc or given their own feet to function as display screens with or without the windows and display screens, as described. The same construction can be used to combine the primary Corex versions and indeed to provide feet and finials as decorative features, incidentally causing the vertical edges of the frame element to flex forwards.

A more elaborate version uses hollow section rods which are provided with a slit so that they can embrace the ,also slit, penultimate flutes of the frame element, and be held in place by the resilient flap of the frame flute pressing the "rod" into the said flute.

Note that similar hollow section rods can be fitted onto the edges of the display screen, with

angled ends so that they are constrained in place by the hoops. These also can have a decorative function.

The embodiment shown in Figures 20-23 is assembled as follows:

The first rod 29 is placed in the Corex flute above the centre line of the backing panel 37 with hoops 31 attached and the (lower) end is inserted into the Corex at the corner of the frame element 33. The second rod with hoops 33 attached is placed over the backing panel 37 and similarly into the framing element 33. From the other side the display screen 2 is placed so that the corners overlap the angled corners of the frame element 33. The hoops 31 are then rotated into position, until all four corners are enclosed. It is preferable to position the display item 17 at this stage prior to insertion of the paper clip, or even with one or two hoops 31 undone to relieve pressure. Extra clips similarly inserted into the Corex or staples to engage the rear rod(s) 27,29 can be used to prevent movement of the backing panel 37 in larger embodiments.

Further steps to organise the rear for hanging/table top use are then carried out, as described above. Front rods can also be deployed for extra security, if required.

Alternative arrangements of the embodiment shown in Figures 4 to 9 are shown in Figures 24 and 25. These arrangements have diagonal and parallel rear struts respectively and are not provided with a backing element.

The embodiment shown in Figure 26 uses a hoop /frame composite such that the hoops are made by folding a flap up, down or round to the normal hoop position. As this hoop can resistantly meet the display screen, the front security rods, become optional. The folded under flaps also act as spacers for parallel hanging.

A further embodiment is shown in Figure 26. It is possible to dispense with both rods if the hoops are self-supporting by being dynamically loaded as holes in folded back flaps from a framing element of resilient material. These may be vulnerable and can be supported by other elements as before.

The embodiment shown in Figure 27 shows as front and rear rods penetrating eight holes in the frame element 33 which then blocked movement of the display frame by contact with it and provides a potential clamping force.

In the embodiment shown in Figure 27, if the hoops are not used both front and rear rods are sufficient to block forward and backward movement of the planar display element, and still assuming a planar element of equal dimensions to the frame aperture, it cannot slide horizontally and vertically because these directions are blocked by the frame element as before. Even if the frame element is curved to become self-supporting (and the dimensional constraints being maintained in elevation) a minimal but effective bearing will be maintained in the corner. Thus it is only in the case where, only one set of rods is used, and the planar element must therefore be larger than the effective frame aperture so using the flanges of the frame element as restraining rods, wherein the planar element is constrained by slots. The second pair of rods, in the present invention, ensures that curvature, or a stressed flat form, is maintained by the scaffold and not the planar element, interacting with the frame element.

Considering now the embodiment of the present invention shown in Figures 32 to 36. This embodiment is directed to a design for an economy demountable, flat packable, display frame, suitable for self

assembly and easy exchange of display items. The aim, at least in preferred arrangements, is to provide a means of securing displayed material behind a transparent screen and to provide a means of anchoring a hanging element for wall mounting and a support for table top mounting. The displayed material can be anything from art to a certificate; mirrors, lamps or electronic displays may also be accommodated. The invention comprises a structural system which can be extended to form multiple two- dimensional units and also three-dimensional structures.

A one piece frame element is employed capable of restraining the display screen 2 on at least two parallel sides, (at least in the forwards direction relative to the frame element), and uses rods 27,29 on the other side (i.e. normally the rear) to block backward movement since the rod ends are located in holes in the structure of the frame element 33. The frame element 33 could be drilled to provide these holes but using a linear box structure such as the polypropylene sheet known as "Corex" provides integral hollow tubes into which the rods 27,29 can be inserted. In fact instead of two parallel rods being used four shorter lengths as "pegs" could be used also pressing the display screen 2 forward onto the frame, but this is not preferred. Either rods (or pegs) thus provide pressure to secure the displayed material against the display screen 2.

Using Corex also provides a simple way of locating the display screen 2 within the frame aperture since a grooved slot 41 can be achieved on two parallel edges of the window aperture so that the display screen 2 can be inserted. The alternative is to angle cut the window edge in a solid material.

This requires either some elasticity in the material (which is limited in Corex as found) and/or bendable display screen 2, and/or that the sides of

the groove 1b are designed as resiliently flexible flaps, as is envisaged in the preferred version.

For this reason, in the preferred arrangement, at least two ends of the flap sides of the groove 1b are cut away to form an access slot 1d, (so that the aperture form narrows to form the grooves). The display screen 2 can thus be inserted in a parallel motion. Depending on tolerances in the relative thicknesses of the display screen 2 and the depth of the groove 1b flexible plastic glass further helps in feeding the display screen 2 into the combined slot created by both sides of the framing element 33 acting together.

The access slot 1d can be expressed as a void at the top and bottom of the display screen 2, as in the illustrated version and the rods can be used to secure decorative components exposed contained within the slot (e.g. coloured twisted ribbon elements, not illustrated). Accordingly the shape of the display screen 2 itself, given a square as the display area will be a rectangle. i.e. to achieve the bearing overlap.

On a practical level the access slot 1d can be doubled in width by sliding the display screen up and down, thereby gaining greater access space to manipulate the position of the displayed material, and to slide the primary locating rods in and out of their respective tubes in the frame element, so as to relieve pressure. As a minimum only the ends of two corresponding flaps on one side ,such as the rear, need be cut away to form an access slot. Movement of the rods can also be achieved by providing "prods" of similar material to gain access from the outside edge of the frame.

This minimal format can be used in conjunction with a backing panel also slotted into the frame aperture in the same way, and into which a hanging

device can be incorporated, or indeed simply attached to the frame itself, so even the backing panel is not a vital element of the invention and neither are the primary rods required for securing the backing panel, or displayed material, in so far as stability of the display item can be achieved by control of dimensional tolerances .(It is envisaged that to avoid damage to the display item a backing sheet would be necessary, ideally being inserted with the display material as a "sandwich". In fact in all versions of the invention it is assumed that the display item may comprise an integral backing sheet or panel for extra protection.)

For extra security, especially on larger versions, and as an alternative to, or in addition to, any restraining action in forward or backward directions by the frame element, a second set of two parallel rods 23,25 (or four pegs) are located into the frame structure in the same way as the rear rods 27,29. The rods are themselves held in place by being flexed, and/or being dimensionally coordinated to fit snugly into respective holes. For ease of assembly simply flexing the rods 23,25,27,29(as dimensionally necessary) over the display screen 2 is effective but equally effective is causing them to resiliently flex towards each other by being passed through, appropriately selected, holes in a backing sheet, or back hanging plate.

In fact Corex can be used for this purpose, with rods 23,25,27,29 again being passed through the tubular structure.

Again for the table top version a folded and shaped piece of Corex can provide a simple support 19 in a variety of forms including as envisaged a long folded edge, parallel to the grain, such that adequate stiffness can be simply achieved. The strut element 19 can then be tucked under the rear rods 27,29 if, as envisaged the ensemble is rotated 90 degrees for table

top presentation. Otherwise, for instance because a portrait format is required, then the rear support can be tucked under the rear rods 27,29, and preferably shaped with two slots cut in the grain so that it can be placed with the rods 27,29 in the slots so that the folded section is held at an angle, thus making a firm support: the ensemble can then be displayed at an incline, as normal for table-top frames.

Additionally, extra rods can be inserted into the (structure of) the frame element 33 next to the outer (vertical) edges, so that when slid down, (or dimensionally extended), they act as feet, raising the frame base off the table-top, and thus, as a safety feature retracting at the top. In wall-hanging or table-top made they are slid into a symmetrical position. So that they are firmly held in place, but are not two difficult to insert, the rear surface of the frame element 33 can be cut so that the rods can be pushed through the now slotted tube more easily. Clearly smaller rods would slip out from their position. The presence of these rods will likely cause a deformation of the frame element 33 forwards at the affected edges, (which is considered visually desirable.)

Performance dictates therefore that the latter rods will be of a larger gauge than the primary structural rods holding the display screen 2 in position. The cross-sectional shape of the rods is not critical but square is preferred for the smaller primary rods and circular is more functional for outer rods.

However the larger rods are most suited to taking a primary role in the construction of multiple structures. Linear multiples are made simply by extending the rods. Three-dimensional multiples can be achieved by using the large edge rods as hinge bolts with frame elements cut at the edges to form inter-

locking panels. This format is envisaged as the basis for a lamp unit, for instance, (in table-top or wall-mounted mode.)

Suitable materials include Corex frame element, with Corex hanging plate, table-top support, or backing sheet, made from the cut out panel as convenient. The display screen 2 can be plastic glass and the rods can be made of box wood or other structurally resilient and reliable material. In fact any materials can be used that meet the functional requirements.

A cut-out frame 1 with front and rear flaps 1c on two sides of the aperture accommodates a display screen 2. The preferred cut out shape to ease insertion of the display screen 2 cuts away the flaps of the groove 1b to create a wider section at least at one end 1d (but both ends in preference for symmetry when rotated). Again for ease of assembly, the transparent screen is dimensioned (optionally) so that, when in position, in its "grooves" 1b, it does not occupy the access slot 1d whereby it was inserted into the frame aperture. (The ends of the slot 1d can be shaped for stylistic effect, but not illustrated.) This also makes insertion of the rods 3 easier. They locate the displayed material 2d and can easily moved to make changing displays easier.

The rear rods 3 are inserted into the tubular cavities in the frame element 1. For non-transparent Corex the rods may extend beyond the outside edges of the frame to ensure bearing is achieved. Said rods are themselves held in place by being flexed together by passing through a Corex back/ hanging panel 5, (with central hole) 8, also causing flexure. An improved back panel 6 is scored and folded 9, and prepared with slots 7 to engage the rods, such that firmness can be achieved and the ensemble displayed at an incline on a table-top 10. Also ,in preference to a simple hanging

hole, the back panel is prepared with slots/holes cut in the rear outer surface to accommodate a hanging string with toggle ends for which a standard paper tie is suitable. (In this way the displayed material is still protected from direct contact with the wall hook.)

To achieve a pair of feet for the table top version, as well as an improved structural component for multiple versions (not illustrated), and a more robust and finished look, a pair of larger rods 11, are pushed into slotted tubes 11b, at the edge of the framing element 1. They can be adjusted for length, by sliding in the tubes, depending on format. Though likely to be a default feature ,they are not functionally necessary for the basic model of the invention.

The drawings also show the option of extra front rods 4. (These are shown as figures 1b, 2b, 3b,and 4b.) These may optionally be located over the groove 1b in which the display screen 2 sits. As with the rear rods the Corex offers flexible choice in this respect to suit the displayed material.

Also the display screen which would normally be a horizontal rectangle for a square image can be rotated so that it does not sit in the side grooves but relies on a pair of front rods to be secure. A smaller rectangular image can then be accommodated in the standard frame for square format, by re-locating the rear rods 3, and front rods 4.

The drawings show a portrait format in the wall-hanging version: to achieve a landscape format the ensemble can simply be rotated 90 degrees, or a separate differently proportioned version of the invention can be made. (Larger wall-mounted versions are more suited to "landscape" as a default format.)